ELSEVIER

Volume 251, Numbers 1–2, April 1997

Journal of ALLOYS AND COMPOUNDS

Contents

Preface xi

Organisers and sponsors xiii

Substrates/growth/epitaxy induced defects

$SrLaGaO_4$–$SrLaAlO_4$ solid solutions: new promising substrate materials for HTSc 1
M. Berkowski (Warsaw, Poland)

Optical phonons probe of the $SrLaAlO_4$ crystal structure 7
V.G. Hadjiev (Stuttgart Germany and Sofia, Bulgaria), M. Cardona (Stuttgart, Germany), I. Ivanov (Sofia, Bulgaria), V. Popov, M. Gyulmezov (Sofia, Bulgaria and Paris, France), M.N. Iliev (Sofia, Bulgaria), M. Berkowski (Warsaw, Poland)

Transmission electron microscopy investigations of defects in molecular beam epitaxy-grown oxide films 11
E.J. Williams (Rüschlikon and Genève, Switzerland), A. Daridon (Rüschlikon and Bern, Switzerland), F. Arrouy (Rüschlikon, Switzerland), J. Perret, Y. Jaccard (Rüschlikon and Neuchâtel, Switzerland), J.-P. Locquet, E. Mächler (Rüschlikon, Switzerland), H. Siegenthaler (Bern, Switzerland), P. Martinoli (Neuchâtel, Switzerland), Ø. Fischer (Genève, Switzerland)

In-situ growth studies of sputtered YBCO thin films by spectroscopic ellipsometry 15
M.E. Bijlsma, D.H.A. Blank, H. Wormeester, A. van Silfhout, H. Rogalla (Enschede, The Netherlands)

Nucleation and growth of $YBa_2Cu_3O_{7-\delta}$ on wavy step edges in (001) $LaAlO_3$ 19
M. Gustafsson, E. Olsson, H.R. Yi, D. Winkler, T. Claeson (Göteborg, Sweden)

Substrate-mediated control of the microstructure of $YBa_2Cu_3O_{7-\delta}$ thin films 23
T. Haage, J. Zegenhagen, M. Cardona, H.-U. Habermeier (Stuttgart, Germany)

The relation between the defect structure, the surface roughness and the growth conditions of $YBa_2Cu_3O_{7-\delta}$ films 27
B. Dam (Amsterdam, The Netherlands), C. Træholt (Delft, The Netherlands), B. Stäuble-Pümpin, J. Rector, D.G. de Groot (Amsterdam, The Netherlands)

Surface roughness and height–height correlations dependence on thickness of YBaCuO thin films 31
D.H.A. Blank, M.E. Bijisma, R. Moerman, H. Rogalla (Enschede, The Netherlands), F.J.B. Stork, A. Roshko (Boulder, CO, USA)

Modulated sputtering process for smooth surface YBCO film deposition 34
C. Camerlingo, B. Ruggiero, M. Russo, E. Sarnelli (Napoli, Italy), A. Del Vecchio, F. De Riccardis, L. Tapfer (Brindisi, Italy)

Stress and microstructure in YBaCuO thin films on MgO and $SrTiO_3$ substrates studied by X-ray diffraction and bending tests 37
S. Auzary, F. Badawi, L. Bimbault, J. Rabier, R.J. Gaboriaud (Futuroscope, France)

Characterization of the interface between laser ablated YBCO film and buffered sapphire substrate 41
S.Y. Lee (Seoul, Korea)

Preparation of BiSrCaCuO thin films by atomic layer-by-layer molecular-beam-epitaxy and high-resolution transmission electron microscopy analysis of the film/substrate interface and of growth defects 44
J. Dreßen (Aachen, Germany), N.D. Zakharov (Halle/Saale, Germany), H. Hoffschulz, H. Stahl (Aachen, Germany), D. Hesse (Halle/Saale, Germany), G. Güntherodt (Aachen, Germany)

Elsevier Science S.A.

Optical and photoacoustic studies of target ablation for LPVD of YBCO thin films 4
I. Apostol, R. Stoian, R. Dabu, A. Stratan (Bucharest, Romania)

Ultrathin films/grain boundary formation

Gibbs energy and growth habits of YBCO 5
F.M. Granozio (Napoli, Italy and Grenoble, France), U.S. di Uccio (Napoli, Italy)

X-ray diffraction analysis of YBaCuO ultra-thin film growth 6
G. Linker, D. Hüttner, O. Meyer, M. Ohkubo, J. Reiner (Karlsruhe, Germany)

Abnormal Raman intensity enhancement of Cu–Cu vibration with film thickness reduction in $YBaCuO_{7-\delta}$ on $LaSrAlO_4$ . . . 7
P. Zhang, T. Haage, H.-U. Habermeier, A. Kazimirov, T. Ruf, M. Cardona (Stuttgart, Germany)

Effects of in-plane high angle grain boundaries in $YBa_2Cu_3O_7$ thin films epitaxially grown on (100) MgO on their physical properties 7
X. Castel, M. Guilloux-Viry, J. Padiou, A. Perrin, M. Sergent, C. Le Paven-Thivet (Rennes, France)

Influence of the growth mechanism on the grain boundary structure in $YBa_2Cu_3O_7$ thin film bicrystals 7
J. Ayache (Orsay, France), A. Thorel (Evry, France), J. Le Duigou (Meudon, France), J. Bonevich (Gaithersburg, MD, USA), U. Dahmen (Berkeley, CA, USA)

Glancing incidence X-ray characterization of ultrathin $YBa_2Cu_3O_{7-x}$ films fabricated by modulated magnetron sputtering . . . 8
A. Del Vecchio (Brindisi, and Lecce, Italy), L. Tapfer (Brindisi, Italy), C. Camerlingo, M. Russo (Arcofelice, Italy)

Film growth/oxygen related phenomena/oxygen ordering

Persistent photoinduced superconductivity 8
A. Hoffmann, J. Hasen, D. Lederman, T. Endo (La Jolla, CA, USA), Y. Bruynseraede (Leuven, Belgium), I.K. Schuller (La Jolla, CA, USA)

Mechanism of oxygenation of YBaCuO thin films during in situ growth by cathodic sputtering: effect of atomic oxygen 9
J. Garcia-Lopez, J. Siejka (Paris, France), L.M. Mercandalli (Orsay, France)

Raman spectroscopy as analytical tool for the local structure of $YBa_2Cu_3O_x$ thin films 9
M.N. Iliev (Stuttgart, Germany and Sofia, Bulgaria), P.X. Zhang, H.-U. Habermeier, M. Cardona (Stuttgart, Germany)

Study of apical oxygen atoms in a spin-ladder cuprate compound by X-ray absorption spectroscopy near the Cu K edge 10
C.J. Hatterer, B. Eustache, L. Collin (Paris, France), A. Michalowicz (Créteil and Orsay, France), J. Moscovici (Créteil, France), C. Deville Cavellin (Paris and Créteil, France), C.F. Beuran, C. Partiot, P. Germain, X.Z. Xu, M. Laguës (Paris, France), A. Traverse (Orsay, France)

Model for reactive sputtering. Optimisation results for YBaCuO thin films deposited on polycrystalline zirconia substrates . . . 10
A. Degardin, E. Caristan, T. Pech, A. Kreisler (Gif-sur-Yvette, France)

Oxygen depth profiling using the $^{16}O(d,\alpha)^{14}N$ nuclear reaction 11
I. Khubeis, K. Toukan, R. Al-Rjob (Amman, Jordan)

Twin-free $YBa_2Cu_3O_{7-\delta}$ films on (001) $NdGaO_3$ showing isotropic electrical behaviour 11
J.H. Rector (Amsterdam, The Netherlands), P. Koster (Enschede, The Netherlands), F. Peerdeman (Almelo, The Netherlands), D.G. de Groot, B. Dam (Amsterdam, The Netherlands)

Growth and electrochemical oxidation of MBE-grown *c*-axis La_2CuO_4 thin films on different substrates 11
A. Daridon (Bern and Rüschlikon, Switzerland), H. Siegenthaler (Bern, Switzerland), F. Arrouy (Rüschlikon, Switzerland), E.J. Williams (Rüschlikon and Genève, Switzerland), E. Mächler, J.-P. Locquet (Rüschlikon, Switzerland)

The effect of selected process parameters on laser ablated YBCO thin films on $SrTiO_3$ substrates 12
F. Wellhöfer, P. Woodall, D.J. Norris, M. Aindow, M. Slaski, L.G. Earwaker (Birmingham, UK)

The influence of bias voltage on $YBa_2Cu_3O_{7-x}$/metal point contact interface 12
M. Grajcar (Jena, Germany and Bratislava, Slovak Republic), A. Plecenik (Bratislava, Slovak Republic and Jena, Germany), P. Seidel (Jena, Germany), P. Kúš (Bratislava, Slovak Republic)

TEM investigation of halide CVD grown $Bi_2Sr_2CaCu_2O_{8+x}$ films 13
A. Hårsta, J. Lu (Uppsala, Sweden)

Structural defects and transport in HTS thin films

Effects of columnar defects and intrinsic pinning on the Bose-glass transitions of $YBa_2Cu_3O_7$ and $Bi_2Sr_2CaCu_2O_8$ thin films . 138
G. Nakielski, M. Kaufmann, A. Rickertsen, M. Baumann, M. Schilling (Hamburg, Germany), G. Wirth (Darmstadt, Germany), T. Amrein (Erlangen, Germany), J. Kötzler (Hamburg, Germany)

Field-anisotropy of critical current of YBaCuO films sputtered on various types of substrates 142
O. Sarrhini, J. Baixeras, E. Caristan, J.-C. Martin, A. Kreisler (Gif sur Yvette, France)

Investigation of the magnetic flux density distribution, current distribution and magnetization curve of Y–Ba–Cu–O thin films 146
A. Forkl, C. Jooß, R. Warthmann, H. Kronmüller, H.-U. Habermeier (Stuttgart, Germany)

Influence of the magnetic field sweep rate on flux creep in highly textured thin film of $YBa_2Cu_3O_{7-\delta}$ 150
K. Frikach, S. Senoussi (Orsay, France), A. Taoufik (Agadir, Moroco), M. Boudissa (Orsay, France)

Properties of thin and ultra-thin YBCO films grown by a Co-evaporation technique 156
J. Lesueur, M. Aprili, T.J. Horton, F. Lalu (Orsay, France), M. Guilloux-Viry, A. Perrin (Rennes, France), L. Dumoulin (Orsay, France)

Anisotropic in-plane properties of 10° and (103)/(013) YBCO films 161
R.P. Campion, K. Horbelt, P.J. King, S.M. Morley (Nottingham, England), H.-U. Habermeier, B. Leibold (Stuttgart, Germany)

Evidence of a "notch effect" in microwave surface resistance versus deposition temperature for $Y_1Ba_2Cu_3O_{7-x}$ thin film on MgO (100) substrate 166
Y. Lemaître, D. Mansart, B. Marcilhac (Orsay, France), J. Garcia-Lopez, J. Siejka (Paris, France), J.C. Mage (Orsay, France)

Mapping the variations in properties of PLD films of YBCO deposited over large areas 172
P. Woodall, F. Wellhöfer, D.J. Norris, M. Aindow, L.G. Earwaker (Birmingham, UK)

Large area deposition of YBCO-films by pulsed laser deposition for microwave applications 176
Th. Bollmeier, W. Biegel, B. Schey, B. Stritzker (Augsburg, Germany), W. Diete, Th. Kaiser, G. Müller (Wuppertal, Germany)

AC susceptibility measurements of films with different structural qualities 179
D. Berling, A. Mehdaoui, B. Loegel (Mulhouse, France), G. Leggieri, M. Luisa De Giorgi, A. Luches (Lecce, Italy), A. Del Vecchio (Lecce, Italy, and Brindisi, Italy), L. Tapfer (Brindisi, Italy)

Tunneling barriers/heterostructures/Josephson junctions

Growth defects and interface roughness in $YBa_2Cu_3O_7/SrTiO_3$ superlattices grown by pulsed laser ablation 185
J. Ayache, J.P. Contour, C. Dolin, M. Drouet, D. Ravelosona (Orsay, France)

$YBa_2Cu_3O_{7-\delta}/SrTiO_3$ epitaxial heterostructures on sapphire substrates 193
Yu.A. Boikov (St. Petersburg, Russia), Z.G. Ivanov (Göteborg, Sweden)

Tunnelling barriers for high temperature superconductor devices 196
G.J. Gerritsma, M.A.J. Verhoeven, R. Moerman, D.H.A. Blank, H. Rogalla (Enschede, Netherlands)

Atomic-layer fabrication of high-T_c tunnel junctions 201
I. Bozovic, J.N. Eckstein (Palo Alto, CA, USA)

Characterisation of multilayer ramp-type $REBa_2Cu_3O_{7-\delta}$ structures by scanning probe microscopy and high-resolution electron microscopy 206
D.H.A. Blank, A.J.H.M. Rijnders, M.A.J. Verhoeven, R.M.H. Bergs, H. Rogalla (Enschede, The Netherlands), K. Verbist, O.I. Lebedev, G. Van Tendeloo (Antwerp, Belgium)

Structural and electrical properties of $PrBa_2Cu_{3-x}Ga_xO_7$ ($x = 0.2$) thin films and $[PrBa_2Cu_{3-x}Ga_xO_7)_M/(YBa_2Cu_3O_7)_N]_P$ superlattices grown by pulsed laser deposition 209
J.P. Contour, M. Drouet (Orsay, France), B. Fisher, L. Patlagan (Haïfa, Israel), D. Ravelosona (Orsay, France)

Smooth and low outgrowth-density $Pr_1Ba_2Cu_3O_{7-x}/Y_1Ba_2Cu_3O_{7-x}$ pulsed laser deposited thin films for ramp junctions 213
D. Dubreuil, G. Garry, O. Géry, K. Bouzehouane (Orsay, France)

Fabrication and properties of *c*-axis and *a*-axis oriented $EuBa_2Cu_3O_7/SrTiO_3$ superlattices 21
M. Vélez, E.M. González, J.M. González, A.M. Gómez, J.L. Vicent (Madrid, Spain)

Emerging materials/HTS thin film properties

Electronic structure of the copper oxides ladder compounds $La_2Cu_2O_5$ and $SrCu_2O_3$ in a weak coupling model 22
P. Germain, M. Lagues (Paris, France)

Y–Ba–Cu–O thick film preparation using multistep KrF excimer laser deposition 22
K. Ebihara, K. Shingai, Y. Yamagata, T. Ikegami (Kumamoto, Japan), A.M. Grishin (Stockholm, Sweden)

Interface thermal modelling and characterisation of YBaCuO infrared bolometers 23
A. Gaugue, Z. Ben Ayadi, J.M. Depond, A. Kreisler (Gif-sur-Yvette, France)

Micron scale stacked structures fabricated from BSCCO 2212 single crystal whiskers 23
Yu.I. Latyshev, V.N. Pavlenko, J.E. Nevelskaya (Moscow, Russia), P. Monceau (Grenoble, France)

MBE Growth of compounds on the copper rich side of the (Sr,Ca)CuO system 24
B. Eustache, F.C. Beuran, C. Deville Cavellin (Créteil, France), C.J. Hatterer, V. Mairet, C. Partiot, X.Z. Xu, P. Germain, M. Laguës (Paris, France)

Precursors

MOCVD precursor design issues. Recent advances in the chemistry and vapor pressure characteristics of Ba(hexafluoroacetylacetonate)$_2$ · polyether complexes 24
T.J. Marks, J.A. Belot, C.J. Reedy, R.J. McNeely, D.B. Studebaker, D.A. Neumayer, C.L. Stern (Evanston, IL, USA)

Single-source MOCVD of Y-, Ba- and Cu-oxides from thd-precursors 24
L. Klippe, G. Wahl (Braunschweig, Germany)

Precursors for chemical vapor deposition of yttrium barium copper oxide 25
D.J. Otway, B. Obi, W.S. Rees Jr. (Atlanta, GA, USA)

Deposition methods

TS thin films by innovative MOCVD processes 26
F. Weiss, U. Schmatz, A. Pisch, F. Felten, S. Pignard, J.P. Sénateur (St Martin d'Hères, France), A. Abrutis (Vilnius, Lithuania), K. Fröhlich (Bratislava, Slovak Republic), D. Selbmann (Dresden, Germany), L. Klippe (Braunschweig, Germany)

MOCVD of HTS and GMR perovskites by aerosol and liquid delivery MOCVD 27
K.-H. Dahmen, M.W. Carris (Tallahassee, FL, USA)

The growth of (001) $YBa_2Cu_3O_{(7-\delta)}$ thin films on (001) MgO by pulsed organo–metallic beam epitaxy with controlled in-plane orientation 27
D.B. Buchholz, J.S. Lei, S. Mahajan, P.R. Markworth, R.P.H. Chang, B. Hinds, T.J. Marks (Evanston, IL, USA), Y. Huang, K.L. Merkle (Argonne, IL, USA)

Growth of $YBa_2Cu_3O_7/CeO_2/Al_2O_3$ heteroepitaxial films by aerosol MOCVD 28
K. Fröhlich, D. Machajdík, I. Vávra, J. Šouc, A. Rosová (Bratislava, Slovak Republic), A. Figueras (Barcelona, Spain), F. Weiss (Saint Martin d'Heres, France), K.-H. Dahmen (Tallahassee, FL, USA)

Synthesis and characterisation of YBCO thin films grown by injection-MOCVD 28
J.P. Sénateur, F. Felten, S. Pignard, F. Weiss (Saint Martin D'Heres, France), A. Abrutis, V. Bigelyte, A. Teiserskis, Z. Saltyte, B. Vengalis (Vilnius, Lithuania)

Deposition and film characterisation

MOCVD with gas phase composition control for the growth of high quality $YBa_2Cu_3O_{7-x}$ thin films for microwave applications 29
J. Musolf (Santa Barbara, CA, USA)

A study by FTIR and mass spectroscopy of the decomposition of precursors for the MOCVD of high temperature superconductors 29
M.L. Hitchman, S.H. Shamlian, G.G. Condorelli, F. Chabert-Rocabois (Glasgow, UK)

Superconducting properties of $Y_xHo_{1-x}Ba_2Cu_3O_7$ epitaxial films 303
A.A. Molodyk, O.Yu. Gorbenko, A.R. Kaul (Moscow, Russia)

YSZ buffer layers on technical substrates for HTSC current applications prepared by AAMOCVD 307
M. Krellmann, D. Selbmann (Dresden, Germany), U. Schmatz, F. Weiss (St. Martin d'Heres, France)

Preparation of buffer layers for HTS materials by MOCVD 310
M. Becht, T. Morishita (Tokyo, Japan)

Growth of epitaxial TlBaCaCuO *a*-axis oriented films on $LaAlO_3$ buffer layers grown on $SrTiO_3$ (100) substrates 314
G. Malandrino, A. Frassica, G.G. Condorelli, G. Lanza, I.L. Fragalà (Catania, Italy)

An improvement of surface smoothness and lattice match of CeO_2 buffer layers on R-sapphire processed by MOCVD 318
I.E. Graboy, N.V. Markov, V.V. Maleev, A.R. Kaul, S.N. Polyakov (Moscow, Russia), V.L. Svetchnikov, H.W. Zandbergen (Delft, Netherlands), K.-H. Dahmen (Tallahassee, FL, USA)

Twinning behaviour in YBCO and PBCO thin films and in PBCO–YBCO superlattices 322
N. Didier, C. Dubourdieu, A. Rosova, B. Chenevier, V. Galindo (Saint Martin d'Hères, France), O. Thomas (Marseille, France)

MOCVD routes to Tl-2212/MgO/Tl-2212 trilayers — preliminary observations on growth and microstructural/electrical properties 328
B.J. Hinds, R.J. McNeely, J. Chen, C. Dias, D.L. Studebaker, T.J. Marks, T.P. Hogan, J.L. Schindler, C.R. Kannewurf (Evanston, IL, USA)

Effect of Ba–Ca–Cu precursor matrix on the formation and properties of superconducting $Tl_2Ba_2Ca_{n-1}Cu_nO_x$ films. A combined metalorganic chemical vapour deposition and thallium vapour diffusion approach 332
G. Malandrino, G.G. Condorelli, G. Lanza, I.L. Fragalà (Catania, Italy), U. Scotti di Uccio, M. Valentino (Napoli, Italy)

MOCVD of perovskites with metallic conductivity 337
O.Y. Gorbenko, A.R. Kaul, A.A. Molodyk, V.N. Fuflyigin, M.A. Novozhilov, A.A. Bosak (Moscow, Russia), U. Krause, G. Wahl (Braunschweig, Germany)

Metalorganic chemical vapour deposition of high quality $LuBa_2Cu_3O_{7-\delta}$ thin films. Peculiarities of growth and superconducting properties 342
S.V. Samoylenkov, O.Yu. Gorbenko, A.R. Kaul, Ya.A. Rebane (Moscow, Russia), V.L. Svetchnikov, H.W. Zandbergen (Delft, The Netherlands)

Characteristic doping-dependent properties of HTS cuprate thin films prepared via MOCVD 347
J.L. Schindler, C.R. Duran, F. DiMeo Jr., B.W. Wessels, B.J. Hinds, R.J. McNeely, T.J. Marks, C.R. Kannewurf (Evanston, IL, USA)

Anisotropy of the critical current in YBCO thin films grown by metal organic chemical vapour deposition 351
C. Dubourdieu, O. Lebedev, G. Delabouglise, F. Weiss, U. Schmatz, J.P. Sénateur (St Martin d'Hères, France)

Characterisation of thin film superconducting multilayers and their interfaces using secondary ion mass spectrometry 355
N.J. Montgomery, J.L. MacManus-Driscoll, D.S. McPhail (London, UK), B. Moeckly, K. Char (Sunnyvale, Ca, USA)

Applications

Industrial metalorganic chemical vapor deposition technology for the growth of $YBa_2Cu_3O_{7-\delta}$ 360
B. Schulte (Aachen, Germany), B.C. Richards, S.L. Cook (Ellesmere Port, UK)

Large area deposition of YBCO thick films for applications in resistive fault current limiting devices 366
H.-W. Neumüller, W. Schmidt (Erlangen, Germany), H. Kinder (Munich, Germany), H.C. Freyhardt (Göttingen, Germany), B. Stritzker (Augsburg, Germany), R. Wördenweber (Jülich, Germany), V. Kirchhoff (Dresden, Germany)

Author Index of Volume 251 373

Subject Index of Volume 251 375